Rosa woodsii subsp. *puberulenta* and variety *ertterae* (Rosaceae), New in Western North America

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Abstract. An additional subspecies and two new varieties of *Rosa woodsii* Lindl. (Rosaceae) are recognized in western North America. *Rosa woodsii* subsp. *puberulenta* (Rydb.) W. H. Lewis & Ertter, characterized by an open habit and moderately curved prickles, is the predominant bottomland subspecies occurring in the Colorado Plateau of Colorado, Utah, Arizona, Nevada, New Mexico, and Wyoming. Atypical unarmed populations of *R. woodsii* subsp. *arizonica* (Rydb.) W. H. Lewis & Ertter endemic to Oak Creek Canyon in the Mogollon Rim region of Coconino County, Arizona, are described as *R. woodsii* var. *ertterae* W. H. Lewis. The new combination *R. woodsii* var. *arizonica* (Rydb.) W. H. Lewis is provided for the remainder of *R. woodsii* subsp. *arizonica*. A key to the six subspecies of *R. woodsii* is provided.

Key words: Arizona, Colorado Plateau, IUCN Red List, Oak Creek Canyon, *Rosa*, Rosaceae.

Rosa woodsii Lindl. is unquestionably the most widespread and variable species of *Rosa* L. in North America. The species ranges from southeastern Alaska to north-central Mexico and extends throughout western and central Canada and the United States east of the Sierra-Cascade Axis. In a previous paper (Lewis & Ertter, 2007), we recognized five ecogeographically defined subspecies within the boundaries of *Flora of North America North of Mexico*: *R. woodsii* subsp. *arizonica* (Rydb.) W. H. Lewis & Ertter, subspecies *gratissima* (Greene) W. H. Lewis & Ertter, subspecies *manca* (Greene) W. H. Lewis & Ertter, subspecies *ultramontana* (S. Watson) Roy L. Taylor & MacBryde, and the autonymic subspecies *woodsii*. Within subspecies *gratissima*, one variety was recognized, *R. woodsii* var. *glabrata* (Parish) D. Cole, localized in the San Bernandino Mountains of California. The status of *R. woodsii* var. *maderensis* Henrickson, endemic to northern Mexico, has not yet been evaluated but is provisionally included within subspecies *woodsii*. Ongoing investigation leads us to recognize a sixth subspecies centered on the Colorado Plateau for which the combination *R. woodsii* var. *puberulenta* (Rydb.) W. H. Lewis & Ertter is here provided for use in a pending volume of *Flora of North America North of Mexico*. This conclusion is primarily based on a re-evaluation of herbarium specimens housed at and on loan to the Missouri Botanical Garden, field studies and new collections made in 2008 and 2009, and statistical analysis of sepal glandularity (Table 1) along the lines of comparable studies in other groups of *Rosa* undertaken by the senior author (e.g., Lewis, 1959a, b). Several collections cited as other subspecies in our previous paper (Lewis & Ertter, 2007), including the types of *R. bakeri* Rydb., *R. chrysocarpa* Rydb., and *R. neomexicana* Cockerell, are here assigned to subspecies *puberulenta*. In that same paper (Lewis & Ertter, 2007), we also included *R. adenosepala* Wooton & Standl. as a synonym of *R. woodsii* subsp. *arizonica*, but it is correctly a synonym of subspecies *woodsii*.

1. Rosa woodsii Lindl., Ros. Monogr. 21. 1820. TYPE: U.S.A. (Nebraska–Iowa to Montana, not Missouri): near Missouri River, seeds grown by J. Sabine, Royal Hort. Society; "cultiv. HHS 1825" on herb. collection of plant designated "type" five years following publication of species (neotype, designated by Lewis & Ertter, 2007: 346, CGE).

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Table 1. Comparison of subspecies of *Rosa woodsii*.

No.	*R. woodsii* subspecies	Collections examined*	Stipitate-glandular (%)†	Eglandular (%)‡	Average elevation (ft.)	Range elevation (ft.)
1	*woodsii* South 49°N	176	20	80	4593	470–11,500
2	*woodsii* North 49°N	69	45	55	1738	545–7500
3	*manca*	44	68	32	8703	7000–11,000
4	*arizonica*	88	58	42	7010	5080–10,660
5	*ultramontana*	177	6	94	4136	1200–8000
6	*puberulenta*	37	5	95	6124	4500–7874
7	*gratissima*	29	0	100	6545	3000–10,000

* Collections of subspecies examined from U.S. states and Canadian provinces/territories: (1) AZ, CO, IA, KS, MO, MT, ND, NE, NM, OK, SD, TX, WY; (2) AB, BC [E Rocky Mtns.], MB, NT, SK; (3) AZ, CO, NM, UT, WY; (4) AZ, NM, NV, UT; (5) BC [W Rocky Mtns.], CA, CO, ID, MT, NV, OR, UT, WA; (6) AZ, CO, NV, UT, WY; (7) CA, NV.

† Percentage of collections with sepals abaxially stipitate-glandular.

‡ Percentage of collections with sepals strictly abaxially eglandular or few marginal stipitate glands.

Key to the Subspecies of *Rosa woodsii* North of Mexico

1a. Prickles most commonly curved, infrastipular, rarely absent; sepals often stipitate-glandular (except subspecies *puberulenta*); centered in Colorado Plateau Subprovince.
  2a. Shrubs mostly < 1 m, forming ± open stands, tending to be densely branched; terminal leaflets obovate, less often elliptic, cuneate based, single or multi-serrate; high montane forests to scrub-oak woodlands . . . . . subsp. *manca*
  2b. Shrubs mostly 1–3 m or more, often forming dense thickets, openly branched; terminal leaflets ovate to elliptic, cuneate or round based, single serrate; riparian sites in bottomlands extending into mountainous regions along waterways.
    3a. Sepals generally eglandular; prickles slightly to fully curved, often slender; terminal leaflets commonly longer than 1 cm; epicenter of Colorado Plateau Subprovince . . . . . subsp. *puberulenta*
    3b. Sepals most commonly stipitate-glandular; prickles usually strongly curved, short and stout to long and hooked or occasionally introrse; terminal leaflets commonly shorter than 1 cm; Apachian and southern edge of Colorado Plateau Subprovinces . . . . . subsp. *arizonica*

1b. Prickles commonly straight (straight or curved in subspecies *gratissima*), absent to infrastipular to dense; sepals rarely stipitate-glandular (except 45% subspecies *woodsii* N of 49° parallel in Canada); mostly west of Wasatch Range or east of the Continental Divide.
  4a. Shrubs mostly 1(–2) m, tending to be densely branched; terminal leaflets mostly obovate; centered in the prairies and plains east of the Continental Divide, occasionally extending west through passes . . . subsp. *woodsii*
  4b. Shrubs mostly 1–3 m or more, open to densely branched; terminal leaflets ovate to elliptic to obovate; mostly within or west of Wasatch Range and northern Rocky Mountains.
    5a. Prickles commonly slender, sparse to absent in upper stems, mostly absent on flowering branches; stems openly branching; flowers mostly 3 to 10 or more per inflorescence; centered in northern Great Basin and Columbia Plateau . . . . . subsp. *ultramontana*
    5b. Prickles commonly stout, abundant, present on flowering branches; stems densely branching; flowers mostly 1 to few per inflorescence; centered in Mojave Desert . . . . . subsp. *gratissima*

The new subspecies adds to the five subspecies previously recognized for *Rosa woodsii* (Lewis & Ertter, 2007) as part of the forthcoming treatment for the *Flora of North America*.

1a. Rosa woodsii Lindl. subsp. **puberulenta** (Rydb.) W. H. Lewis & Ertter, comb. et stat. nov. Basionym: *Rosa puberulenta* Rydb., Fl. Rocky Mts. 443, 1062. 1917. TYPE: U.S.A. Utah: San Juan Co., Montezuma Canyon, E of Monticello, 2000 m [elevation from original protologue], 13 Aug. 1911, *P. A. Rydberg & A. O. Garrett 9705* (holotype, NY 415876; isotype, US 765307).

Rosa bakeri Rydb., Fl. Colorado 191. 1906, nom. illeg., non *R. bakeri* A. Dégl., J. Bot. 2: 267. 1894, syn. nov. TYPE: U.S.A. Colorado: La Plata Co., Dix Post Office, 1898, *C. F. Baker, F. S. Earle & S. M. Tracy 474* (lectotype, designated by Lewis & Ertter, 2007: 350, MO 123806; isotypes, BM, E, K, MO 1951244, NY).

Rosa chrysocarpa Rydb., Bull. Torrey Bot. Club 44: 74. 1917, syn. nov. TYPE: U.S.A. Utah: San Juan Co., Allen Cañon, SW of Abajo Mtn., 1800–2000 m, 30–31 July 1911, *P. A. Rydberg & A. O. Garrett 9302* (holotype, NY 415920; isotype, US 765208).

Rosa neomexicana Cockerell, Entomol. News 12: 38. 1901, syn. nov. *Rosa woodsii* var. *neomexicana* (Cockerell) W. C. Martin & C. R. Hutchins, Fl. New Mexico 929. 1980, nom. illeg. [basionym not provided]. TYPE: U.S.A. New Mexico: Otero Co., Sacramento Mtns., Cloudcroft, grown and collected at Mesilla, New Mexico, 4 May 1894, *T. D. A. Cockerell s.n.* (lectotype, designated by Lewis & Ertter, 2007: 350, US 404918; isotype, NY 425856).

Discussion. *Rosa woodsii* subsp. *puberulenta* is characterized by tall stems (1–2 m or more) with limited branching, presenting an open habit. Slender to

moderately thickened prickles, mostly limited to the infrastipular position, are commonly slightly curved, but occasionally fully curved, hooked, or introrsed. Terminal leaflets are mostly broadly elliptic and 2–4 cm long. Sepals are eglandular or with few marginal glands in 95% of examined specimens throughout its range (Table 1). As so characterized, subspecies *puberulenta* is the predominant *Rosa* occurring on bottomlands in the epicenter of the Colorado Plateau Subprovince (McLaughlin, 1989, 2007), comprising Utah east of the Wasatch Range, southwestern Colorado, northwestern New Mexico, and northeastern Arizona. Populations are mostly found in basins by creeks and rivers, river flats, and riparian woodlands, dominated by cottonwood and pine, at elevations of 4500–7900 ft., averaging 6124 ft. (Table 1).

Morphologically comparable specimens exist as far from the distributional epicenter as southeastern Washington and northeastern California, but whether these are best treated as outliers of subspecies *puberulenta* or as sporadic, localized variation within subspecies *ultramontana* remains to be determined. At present, we accept at least the populations cited below from eastern Nevada and southern Wyoming, along with those from the core range, as subspecies *puberulenta*. More problematic are areas deep within the core range of subspecies *ultramontana*, notably the high frequency of collections with curved prickles from the Owyhee Uplands of southwestern Idaho and adjacent Oregon. Populations from the Wasatch Range interface between the two subspecies are ambiguous, as are collections sympatric with subspecies *gratissima* in southern Nevada. Such ambiguity is compatible with our use of ecogeographically defined subspecies (Lewis & Ertter, 2007).

Because of its central location, *Rosa woodsii* subsp. *puberulenta* approaches or overlaps the distribution of all five other subspecies of *R. woodsii* in North America north of Mexico: subspecies *woodsii* to the east, subspecies *arizonica* to the south, subspecies *gratissima* to the southwest, and subspecies *ultramontana* to the northwest. The range of subspecies *manca* is largely sympatric, differing by higher elevation averaging 8703 ft. (Table 1) and habitat (scrub-oak woodlands to high montane forests). An updated key to the six currently recognized subspecies is provided above, emphasizing prickle curvature, sepal glandularity, and general habit. Sepal glandularity, as statistically analyzed in Table 1, is particularly important in distinguishing subspecies *puberulenta* (sepals eglandular or infrequently with few marginal glands in 95% of examined specimens) from subspecies *arizonica* and subspecies *manca*, with the former having 58% and the latter having 68% of collections with stipitate-glandular sepals (Table 1). As noted, the interface and distinction are particularly problematic between subspecies *puberulenta* and subspecies *ultramontana*, a subspecies centered in the Great Basin Subprovince (McLaughlin, 1989, 2007) extending north into central British Columbia (Lewis & Ertter, 2007). Both subspecies have a similar open branching habit and eglandular sepals (95% and 94%, respectively; Table 1). However, the prickles of subspecies *ultramontana* are generally straighter, more slender, and often sparser, and flowers can be more numerous (up to 25 flowers per inflorescence vs. one to four in subspecies *puberulenta*). The correlation of morphological and ecogeographic differences is consistent with our use of subspecies in *Rosa* (Lewis & Ertter, 2007).

Selected exsiccatae. U.S.A. **Arizona:** Apache Co., Canyon de Chelly, Tunnel Canyon, *S. L. O'Kane Jr. & G. Rink 6133* (ISTC, SJNM); Greer Hwy., 12 July 1976, *R. Galeano s.n.* (ASC); Navajo Nation, Carrizo Mtns., Teec Nos Pos Canyon, *T. Reeves 10483* (SJNM); Chuska & Tunitcha Mtns., Rte. 13, ca. 4.7 mi. NE of Lukachukai, *T. Reeves 8419* (NAVA, SJNM); Navajo Co., Navajo Nation, Oak Springs near head of Piute Canyon, *S. L. O'Kane Jr. et al. 6190* (ISTC, SJNM). **Colorado:** Archuleta Co., Lower San Juan Mtns., N face of Needles Mtn., *M. Heil 93* (SJNM); Pagosa Springs, *C. F. Baker 399* (E, G, MO); Dolores Co., rd. 12, ca. 1 mi. S of Road J stock pond, *K. Heil & L. Lundquist 23917* (MO, SJNM); 5 mi. E of Dove Creek, 4 July 1975, *M. Heil s.n.* (SJNM); Dove Creek, rd. to Dolores overlook, *K. Heil 958* (SJNM); Gunnison Co., Gunnison, *C. F. Baker 532* (E, MO); Mesa Co., 2.4 mi. SE of Gateway, along SW bank of Dolores River, *C. B. Davis 279* (MO); Montezuma Co., 4–5 mi. E of hwy. 145 on Hwy. 184 from Dolores to Mancos, *B. Ertter & L. Woodruff 18478* (MO, UC); Dolores City Park on E side of town, N side of Dolores River, *B. Ertter & L. Woodruff 18477a & b* (MO, UC); Mancos Canyon, 2 mi. up canyon toward San Juan Natl. Forest on rd. 42, *W. H. Lewis & M. Elvin-Lewis 15998* (MO); Montrose Co., 2 mi. W of bridge at Atkinson Creek near Uravan, Y11 rd. along San Miguel River betw. Uravan & Bedrock, *B. Ertter et al. 18471* (MO, UC); Coventry, *E. P. Walker 543* (MO, RM), betw. Montrose & Naturita, 2.3 mi. W of Ute along Rte. 90, *B. Ertter et al. 18468* (MO, UC); 5 mi. S of Montrose, Hwy. 55, *B. Maguire & G. Piranian 12834a* (MO, NY); Naturita, *E. B. Payson & L. B. Payson 3878* (MO); Dolores River at Bedrock, *Payson & Payson 3918* (MO); Sheep Creek Cañon, *Payson & Payson 3889* (MO), *3890* (MO); Paradox, *E. P. Walker 121* (MO, RM); Routt Co., 13.3 mi. S of Hayden, Hayden Gulch rd. 53, 1.8 mi. N of jct. with rd. 29, Williams Fork Mtns., *B. Ertter & L. Woodruff 19190* (MO, UC); San Miguel Co., ca. 2 mi. SW of Egnar near crossing of Chico Creek, *K. Heil et al. 19071* (SJNM). **Nevada:** Lincoln Co., base of Bald Mtn., E of Nellis Air Force range, s.d., *P. L. Comanor s.n.* (RENO); Caliente, *L. N. Goodding 941* (NAVA); 11 mi. SSW of Caliente, Kershaw Canyon, *I. LaRivers & N. F. Hancock 673* (RENO); Kershaw–Ryan State Park, *J. H. Robertson 51–74* (RENO); White Pine Co., Baker Creek, Governor's camp, Mt. Jeff Davis, *B. Maguire & A. G. Richards 2656* (UC); fork of Berry Creek, 2.5–4 mi. above Berry Creek Ranger Station, *P. Train 1046* (RENO), along Lehman Creek at Trailer Camp, *J. H. Robertson 56–74* (RENO); 1 mi. S of Lehman Cave's Ranger Station, *B. O. Moore & G. E. Franklin Jr. 565* (RENO); 16 mi. N of McGill, Indian Creek, Schell Creek Range, *P. Train 987*

(RENO); W of Ely, by Hwy. 50, *R. Everett s.n.* (RENO); 15 mi. E of Ely, *B. O. Moore & G. E. Franklin Jr. 696* (RENO); 18 mi. E of Ely off Hwy. 486, just N of Cave Lake State Park along Steptoe Creek, *W. Hess et al. 7596* (MO, MOR). **New Mexico:** Rio Arriba Co., Chama, *C. F. Baker 398* (G, K, MO); San Juan Co., 2 mi. W of Aztec, river bottom, *M. Sullivan 898* (SJNM); Jewett Valley Tract (BLM), access at #147 CR 6700, *T. Reeves & L. Reeves 9418* (SJNM); Sandoval Co., Cuba, 1924, *s. coll.* (MO). **Utah:** Beaver Co., 10 mi. E of Beaver on Hwy. 135, Beaver Creek Canyon, Tushar Mtns., *A. J. Breitung 17860* (BM, DAO); ca. 13 mi. ENE of Milfred, Bailey's Spring, *s. coll. 13950* (BRY, MO); Carbon Co., along Price River, *L. H. Malbutt 40* (MO, UT); 10 mi. N of Wellington, Pine Canyon, *E. H. Graham 8315* (CM, MO); Daggett Co., S Green Lakes, *F. J. Hermann 4858* (MO); Duchesne Co., N of Moon Lake, *E. H. Graham 6535* (CM, MO); 4 mi. N of Mtn. Home, *B. F. Harrison & E. Larsen 7592* (BRY, MO); N side of Strawberry Creek, ca. 5 mi. below mouth of Red Creek, *E. H. Graham 9270* (CM, MO); Emery Co., 12 mi. W of Castle Dale, *H. C. Cutler 2379* (MO); Garfield Co., near head of W Fork of Douglas Creek, *E. H. Graham 9696* (CM, MO); 6 mi. W of Panguitch Lake, *G. J. Goodman & C. L. Hitchcock 1600* (MO); Kane Co., vic. of Pine Spring, W of Coral Pink Dunes, *S. L. Welsh 25005* (BRY, MO); San Juan Co., Dugout Ranch, Indian Creek, *S. L. Welsh 20845* (BRY, RENO); Hammond Canyon, Elk Mtns., *P. A. Rydberg & A. O. Garrett 9581* (NY, RENO); Montezuma Canyon, ca. 13 air mi. SSE of Monticello, 6 mi. from Hwy. 191 on Montezuma Creek rd., *B. Ertter & L. Woodruff 18481* (MO, UC); Natural Bridges Natl. Monument, canyon across Kachina Bridge, *L. Vermillion 23* (SJNM); Navajo Nation, rd. 408, ca. 2 mi. SE of Blanding, *K. Heil et al. 24062* (MO, SJNM); San Juan/Grant Co., Manti-La Sal Natl. Forest, Castle Creek basin, *C. Evrard 12295* (BR, MO); Uintah Co., Davis Hollow, Taylor Mtn., *E. H. Graham 7492* (CM, MO); side of Green River, Island Park, *E. H. Graham 9189* (CM, MO); Dry Fork/Brownie Canyon rd., 3.5 mi. NW of Dry Fork settlement, ca. 14 air mi. NW of Vernal, *B. Ertter & L. Woodruff 19176* (MO, UC); Washington Co., SE of Enterprise Reservoir, Grassy Creek, *L. Higgins 19725* (BRY, MO). **Wyoming:** Lincoln Co., Alpine, Wolf Creek near Snake River, *E. B. Payson & G. M. Armstrong 3608* (MO, RM); Sublette Co., Big Piney, *E. B. Payson & L. B. Payson 4356* (MO, RM); Sweetwater Co., 12 mi. below Green River, *H. C. Cutler 3401* (MO); Teton Co., Hoback River, Camp Davis, *L. E. Wehmeyer et al. 5142* (MICH, MO).

In accordance with our use of the varietal rank for significant but highly localized elements (Lewis & Ertter, 2007), unarmed to scarcely prickly collections from Oak Creek Canyon on the Mogollon Rim of Arizona are here described as a new variety of *Rosa woodsii*, included within subspecies *arizonica*. This also necessitates establishing variety *arizonica* as a new combination.

2. Rosa woodsii Lindl. subsp. **arizonica** (Rydb.) W. H. Lewis & Ertter. Basionym: *Rosa arizonica* Rydb., N. Amer. Fl. 22: 516. 1918. TYPE: U.S.A. Arizona: Coconino Co., vic. of Flagstaff, 2134 m, 15 June 1898, *D. T. Macdougal 110* (holotype, NY; isotypes, F, GH, NY, RM, UC, US).

2a. Rosa woodsii Lindl. var. **ertterae** W. H. Lewis, var. nov. TYPE: U.S.A. Arizona: Coconino Co., Oak Creek Canyon at beginning of West Fork Trail, partial shade of riparian forest, 12 Aug. 2004, *B. Ertter 18488 with L. Woodruff* (holotype, MO 6113144; isotypes, ARIZ, ASC, ASU, E, K, MO 6113143, NY, RSA, UC, US).

Haec varietas a *Rosa woodsii* subsp. *arizonica* (Rydb.) W. H. Lewis & Ertter var. *arizonica* (Rydb.) W. H. Lewis caulibus ramisque aculeis plerumque destitutis, habitu aperte ramificante atque sepalis glandulis stipitatis tantum vestitis differt.

Distribution, habitat, phenology, and IUCN Red List category. *Rosa woodsii* var. *ertterae* is endemic to the West Fork of Oak Creek Canyon, and perhaps nearby canyons (Barney Springs, Casner Cabin Draw, Fernow Draw) of Coconino Co., Arizona, between 34°58′55″N and 111°51′45″W along the Mogollon Rim. This variety flowers in late May and June, with hips maturing in August and September, growing on well-drained slopes and in riparian forests and creek beds at elevations of 5300 ft. at the Canyon mouth to 7000 ft. at the rim. The trailhead parking lot near the mouth of the canyon has been significantly altered over the past 100 years where garden relics and many non-native species have been introduced (Gilbert & Licher, 2005), and so sets the area apart from the pristine conditions found in the West Fork Canyon. This suggests a nearby source of potential contaminants, which could eventually prove damaging to the canyon flora, including *R. woodsii* var. *arizonica* found in disturbed areas near the canyon mouth (Coconino Co., 9 mi. N of Sedona, U.S. alt. rte. 89 to Oak Creek Canyon, 35°00′N, 111°40′W, 1 July 1992, *J. S. Miller et al. 7746* [MO]). Regarding an IUCN conservation assessment of variety *ertterae*, the category Near Threatened (NT) seems most applicable due to restricted occurrence in a heavily used area and the possibility of interbreeding with other *R. woodsii* that occur nearby (IUCN, 2001).

Etymology. The varietal epithet *ertterae* was chosen to recognize Barbara Jean Ertter (b. 1953), renowned botanist of the Rosaceae in western North America and fellow rhodologist, who observed the uniqueness of the Oak Creek Canyon rose and who, together with Lindsay Woodruff, collected the type material.

Discussion. *Rosa woodsii* var. *ertterae* differs from populations of *R. woodsii* var. *arizonica* (Rydb.) W. H. Lewis by having stems and branches that lack prickles even on lower stems or have few, small, curved, and infrastipular prickles; an open branching habit; and only stipitate-glandular sepals.

Paratypes. U.S.A. **Arizona:** Coconino Co., Coconino Natl. Forest, Upper West Fork Canyon of Oak Creek, ca. 10 mi. N of Sedona, within N section of Red Rock/Secret Mtn. Wilderness, 35°1′32″N, 111°50′37″W, 6358 ft., riparian, within creek bed, 24 June 2000, *E. Gilbert 78* (ASC, ASU); Oak Creek Canyon, 16 June 1928, *C. F. Deaver 3186* (ASC); W Fork of Oak Creek, Barney Pasture, 6500 ft., 18 Sep. 1952, *C. F. Deaver 4129* (ASC); well-drained slope, ca. 5300 ft., 17 June 1967, *H. Reese s.n.* (ASC); Upper Oak Creek, 18 Aug. 1945, *C. F. Deaver 1211* (ASC); Oak Creek Canyon at beginning of W Fork trail, 12 Aug. 2004, 4700 ft., *T. Weaver s.n.* (ASC); Mogollon Mtns., Pinchot Ranger station, 6398–7480 ft., s.d., *R. E. Collom 246* (MICH, MO); W Fork of Oak Creek, 111°45′W, 35°3′N, ca. 5300 ft., 27 July 1997, *L. R. Landrum & S. S. Landrum 9094* (ASU); ponderosa zone along stream, 1 Aug. 1975, *L. Pinkava & E. Lehto L18784* (ASU); Oak Creek Canyon, 10 mi. up from Sedona, 24 May 1936, *McLellan & Stitt 890* (ASU).

2b. Rosa woodsii var. **arizonica** (Rydb.) W. H. Lewis, comb. nov. Basionym: *Rosa arizonica* Rydb., N. Amer. Fl. 22: 516. 1918. TYPE: U.S.A. Arizona: Coconino Co., vic. of Flagstaff, 2134 m, 15 June 1898, *D. T. Macdougal 110* (holotype, NY; isotypes, F, GH, NY, RM, UC, US).

Rosa granulifera Rydb., N. Amer. Fl. 22: 517. 1918. *Rosa arizonica* var. *granulifera* (Rydb.) Kearney & Peebles, J. Wash. Acad. Sci. 29: 481. 1939. TYPE: U.S.A. Arizona: Navajo Co., W of Holbrook, 10 July 1896, *M. Zuck s.n.* (holotype, NY 415841; isotypes, MO 123818, NY 415840, US 348991).

Discussion. The creation of variety *ertterae* necessitates a corresponding varietal name for the remainder of subspecies *arizonica*, even though such a large circumscription does not represent our concept of varieties in *Rosa* (Lewis & Ertter, 2007). Because the autonym corresponding to *R. woodsii* var. *ertterae* is variety *woodsii* (McNeill et al., 2006: Art. 26.3), explicit publication is needed for the creation of *R. woodsii* var. *arizonica*, as is done here. Although sometimes ascribed to Martin and Hutchins (1980–1981), their combination is invalid because the basionym was not cited. Priority of the varietal epithet *arizonica* dates from 1939, as the autonym *R. arizonica* Rydb. var. *arizonica* created by the publication of *R. arizonica* Rydb. var. *granulifera* (Rydb.) Kearney & Peebles. Following Recommendation 26A.1 of the *International Code of Botanical Nomenclature* (McNeill et al., 2006), we choose variety *arizonica* rather than variety *granulifera* for use within subspecies *arizonica*.

Data summarizing presence or absence of sepal glandularity and elevation of the six *Rosa woodsii* subspecies are provided in Table 1. Additionally, the subspecies *woodsii* is divided into North and South units representing populations found north and south of the 49° parallel from the Rocky Mountains to the east. This separation shows major differences in sepal glandularity between northern populations having 45% stipitate-glandular sepals compared to only 20% such glandularity in southern populations. In Saskatchewan (North), Harms (1974) reported that sepals are sometimes glandular as well as leaflets and their serrations. In addition, his measurements of petals, hypanthia, sepal bases, and leaflets are larger than those found in populations in the South, and leaflets are more numerous (five to nine) and crowded. He attributed, at least in part, these differences to hybridization, recognizing putative hybrids between *R. woodsii* × *R. arkansana* Porter (2*x* × 4*x*) and *R. woodsii* × *R. acicularis* Lindley (2*x* × 6*x*), the latter given some credence with the finding of a tetraploid (4*x*) in mixed populations of both species at Fort Saskatchewan, Alberta (Lewis, unpublished).

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